

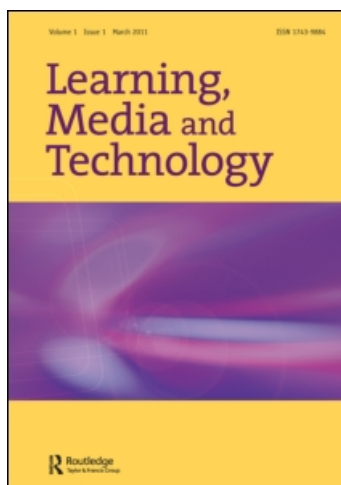
This article was downloaded by: [HEAL-Link Consortium]

On: 15 June 2011

Access details: Access Details: [subscription number 786636649]

Publisher Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Learning, Media and Technology

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713606301>

Balancing the Media

Diana Laurillard^a

^a Institute of Educational Technology, Open University, UK

To cite this Article Laurillard, Diana(1993) 'Balancing the Media', Learning, Media and Technology, 19: 2, 81 — 93

To link to this Article: DOI: 10.1080/0260741930190204

URL: <http://dx.doi.org/10.1080/0260741930190204>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Balancing the Media

DIANA LAURILLARD

Programme on Learner Use of Media, Institute of Educational Technology, Open University, UK

ABSTRACT *This paper outlines a 'conversational framework' for describing the essential elements of the learning process. The framework is used to elaborate the kinds of learning activities students need to carry out in order to arrive at a conceptual understanding of the topic they are studying. The framework is then applied to contrasting learning media: print, video, computer-based tutorial and teacher-student discussion, to determine which learning activities each is capable of supporting. These combinations of 'multiple media' are then compared with the new 'multi-media' systems for their likely pedagogical benefits.*

Introduction

The task of planning and designing educational materials is becoming very complex as the types of media available not only increase in number but also intermarry to produce exotic off-spring, such as multi-media work-stations, interactive satellite teaching, audio-graphics and others. Evolutionary metaphors are inappropriate, however. The evolution of technology is not at all adaptive to the educational environment. Education is attempting to adapt itself radically to the promise of the new technologies, but the new technologies were created for other purposes than to save education. Because of this, the educational design process must not be swept along by the promises of the new technologies, but must use them in a controlled and selective way. This paper considers ways in which the technology would adapt to the educational environment, rather than vice-versa. Beginning with a framework of pedagogical requirements of the technologies, we can then compare them and use them according to how well they fit.

The learning process as a conversational framework

The development of the framework begins with the assumption that academic knowledge consists in descriptions of the world, and therefore comes to be known through a discursive interaction between teacher and student. It cannot be known through experience alone, only through reflection on experience. Because of this second-order nature, academic knowledge certainly requires the first-order knowledge as well, of direct experience of the world, and much of the pedagogic task of

the teacher is to provide students with the kind of access to the world that enables them to have experiences which make sense of the academic's descriptions: experimental work, fieldwork, practical work and project work are all adapted to enhancing and extending the students' experiences of the world. If it were to stop there, then students would be competent to perform within the particular context of their experience, but without the reflective process that they engage in when they discuss that experience, and try to represent it in language or symbols, their competence remains confined. The point of an academic education is to take students beyond the specific to the generalisable, the comparative, the rule-governed descriptions that empower them to use their immediate experience more effectively, and by reflecting on it, to govern it.

The learning process, therefore, consists of four essential component processes. It must be discursive, adaptive, interactive and reflective defined as follows:

- (1) discursive—allowing discussion between student and teacher, where each expresses his/her conception of how some aspect of the world is to be described, and reacts to the other's description;
- (2) adaptive—where, assuming a didactic intention, the teacher adapts the students' interaction with the world to enable them to experience it from the teacher's perspective;
- (3) interactive—allowing students to interact with the world in ways that extend or enhance their experience;
- (4) reflective—where students reflect upon their experiences and their relation to the teacher's description and thereby adapt their own conception and their description of it.

These are all essential aspects of the learning process in the sense that if any one of them is missing, then understanding of the academic concept is not achieved. They do not have to be contemporaneous, and teaching will often rely on past experience to do the job of the interactive component, hence the frequent appeal in teaching situations to helpful analogies and illustrative examples. The following dialogue is an example of how the conversational framework might be instantiated:

- | | |
|--|--------------------|
| T: ... the earth goes round the sun | <i>Discursive</i> |
| S: But the sun goes round the earth. | |
| T: How do you know? | |
| S: It looks as if it does. | |
| T: But how would it look if the earth went round the sun? | <i>Adaptive</i> |
| S: Different | |
| T: Imagine yourself on a stationary roundabout watching a train going round and round, what would you see? | <i>Interactive</i> |
| S: The train whizzing past. | |
| T: Now imagine the train is stationary and the roundabout is going round, what would you see? | |
| S: The train whizzing past | |
| T: Exactly. | |
| S: Oh I see, so it would look the same to me standing on the | <i>Reflective</i> |

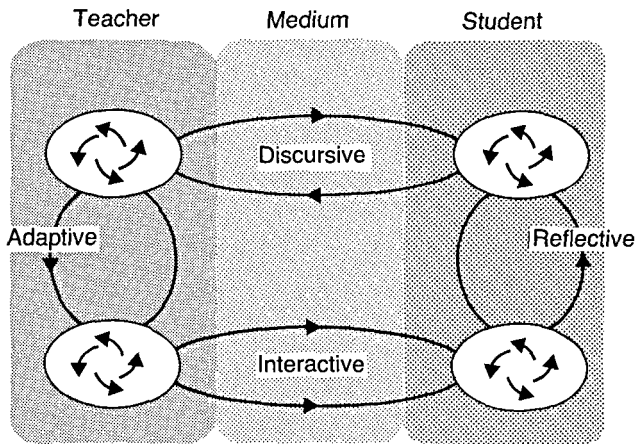


FIG. 1. The complete learning process: essential component relationships.

earth, whether it was going round the sun or the sun was going round it.

Discursive

T: Exactly.

At the discursive level, teacher and student exchange views, and their reasons for them, and that may be sufficient. But if a discrepancy arises, as in the student's supposition that "you can tell by looking", the teacher adapts the discussion, to lead it towards discussion of a common experience that will allow consensus between them. The interactive phase does not require, in this case, direct interaction with the world by setting up the experiment with the roundabout—their past experience is sufficient to allow agreement about the interpretation of that event. The student's reflection on that event then allows her to express her description of it as a new conception of an aspect of the issue under discussion.

Every stage in the framework is necessary. If the student does not express her conception in the first place, the teacher will remain ignorant of it and the rest of their conceptual argument will be building on sand. If they do not adapt the direction of the discussion to extending the student's experience, the same follows. If the student does not perform the "thought experiment" with the roundabout to extend her, albeit imagined, experience, then she will not see why the teacher does not accept the argument that the two situations are different. If the student does not reflect on the thought experiment, her awareness of it will remain bounded in the particular context of the roundabout, rather than being generalised for application to at least one other situation. If they do not express their redescription of the idea, the teacher cannot know if they have achieved the agreement at the discursive level that will allow the conceptual argument to proceed. Figure 1 shows a diagrammatic version of the framework, clarifying the two levels of experience (being interactive with the teacher's world) and description (being discursive between the two participants), and the primary responsibilities of the teacher to be adaptive, and the student to be reflective.

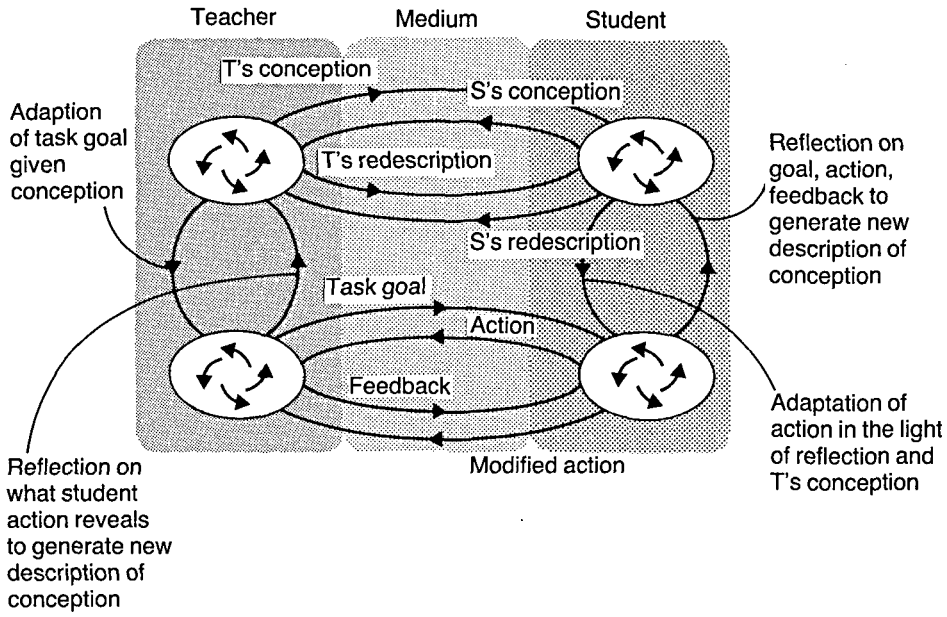


FIG. 2. The complete learning process: essential activities.

The stages characterised in Fig. 1 as a 'conversational framework' embody a series of distinct activities on the part of the two interlocutors, and these are unpacked in Fig. 2. For example, the 'discursive' level in the example contains several different types of contribution: description by teacher of their conception, similar for student, request by teacher for elaboration of student's conception, adaptation of topic focus by teacher, and later at the end a redesign by the student, followed by confirmation of agreement on the new topic. The discursive and interactive levels require more than one exchange to do their job, therefore. Similarly, in the course of a continuing dialogue between teacher and student, the teacher will be using her observations on the way the student interacts with the world to inform the way she explains and redesigns her own conception to the student at the discursive level. And the student will benefit from adapting their actions in the world given the discussion. Hence the addition of complementary processes of adaptation and reflection within each participant's activities. Figure 2 elaborates these exchanges further.

The conversational framework for describing the learning process in Fig. 2 should be applicable to any academic learning situation. It is not applicable to learning through experience, nor to 'everyday' learning, nor to those training programmes that focus on skills alone, all of which occur at the experiential interactive level only. Cognitive psychologists will argue that experiential learning has adaptive and reflective components as well, which is probably a good model, but the 'conversational framework' identifies those as conscious accessible processes. This is important, because it makes it possible for both teacher and student to change the way they do them. The reflection we do as children on the internal

structure of the language we are experiencing, for example, is not always available to conscious control. But as students of a subject, we can consciously stand back from our experience and consider the similarity between, for example the round-about and the earth, and then, having consciously reflected upon it, argue about it. A critical perspective, necessary for academic understanding, is not feasible at the non-conscious experiential level. The two levels are also observably different—the one being talk about the world, the other being action on the world. In the context of education, the distinction is an important one.

The characterisation of the teaching–learning process as a conversation is hardly a new idea. Gordon Pask formalised it as ‘conversation theory’ some time ago (Pask, 1976), including the separation of ‘descriptions’ and ‘model-building behaviours’, and the definition of understanding as “determined by a two level of agreement” (ibid., p.22). Vygotsky described learning in terms of social interaction (Vygotsky, 1962). Many educational ideas have their counterparts in the culture of Ancient Greece, as does this one in the Socratic dialogues, which are still referred to as epitomising the tutorial process. The conversational framework is set out as above to clarify the second-order character of academic learning, and to define its essential components.

Comparing the media

The conversational framework is a convenient description of the learning process, which encapsulates the essential aspects of learning academic knowledge, and provides us with some criteria against which to judge the educational media. And we immediately encounter the inescapable and inconvenient fact that they do not fit the framework very well. The essence of the academic teaching process is a conversation, but almost all the educational media are incapable of handling a conversation with a student. It is very apparent that the technology has not evolved to fit the educational environment.

If the individual media do not easily support all the aspects of the learning process, then we need a representation of what each one can contribute, and thereby of what kind of supplementary teaching–learning interaction it presupposes. Consider the canonical forms of the principal educational media: print, including text pictures and graphics; video, including audio and animation; computer-based tutorial, including tutorial dialogue and simulation model; and the teacher–student discussion, for comparison. For each of these we can identify how well they support the learning process, using the framework as guide.

Print

- The teacher can offer a description in language and pictures.
- The student can only express her conception as written annotations, or responses

to in-text activities set, but there is no reaction to them by the teacher (for discussion see Lockwood, 1989).

- The teacher can offer 'pre-emptive redescription', assuming the student may have some particular misconception, which can be addressed directly in the text.
- The teacher cannot adapt the activities set to the student's needs, as there is no opportunity for the student to communicate her conception.
- The student cannot adapt her actions as there is no direct interaction with the world.
- The teacher may refer to the student's experience as a way of handling the interactive stage.
- There is no interaction with the world for the student to reflect upon, though she may reflect upon the experience referred to by the teacher, as well as on the teacher's description.

Video

- The teacher can offer a description in language, graphics, and dynamic pictures.
- The student can only express her conception as responses to activities set, but there is no reaction to them by the teacher (for discussion see Durbridge, 1984).
- The teacher can offer 'pre-emptive redescription', assuming the student may have some particular misconception, which can be addressed directly in the video presentation.
- The teacher cannot adapt the activities set to the student's needs as there is no opportunity for the student to communicate her conception.
- The student cannot adapt her actions as there is no direct interaction with the world.
- The teacher can extend or enhance the student's vicarious experience of the world by showing an interaction with it. The actions are not the student's own, but she can observe the feedback on someone else's actions.
- The student may reflect upon this vicarious experience of the world, as well as on the teacher's description.

Computer-based tutorial

- The teacher can offer a description in language, graphics and dynamic graphics, though the use of language must be limited, given the difficulty of reading text from a screen.
- The student can only express her conception in a highly constrained form in response to activities set. This often means 'multiple-choice questions' (mcq), which can interfere with learning. A better form is the concealed mcq, which uses keywords to interpret student input.
- If the computer can be programmed to interpret student input reliably, then it can

be programmed to react to the particular category of response they make, and on that basis can offer a redescription designed to cope with that response. The redescription is still 'pre-emptive', however, as the form of reply is decided in advance by the programmer.

- The program can adapt the activities set for the student both on the basis of her past performance on set activities, and on the basis of the categorised input above.
- The student can adapt her actions in the world of the simulated model, on the basis of the feedback they received on previous actions, and in the light of the program's descriptions
- The teacher can extend or enhance the student's direct experience of a simulated world by offering interaction with a computer model of it. The actions are controlled by the student, and she receives feedback on those actions in the form of changes to the output of the model, either numerical, graphical or pictorial.
- The student may reflect upon this simulated experience of the world, as well as on the program's description, and moreover the program can support this reflection as it can keep a record of both the student's actions, and the descriptions offered.

Teacher-student discussion

- Both teacher and student can express their conception as a description, and can offer a redescription in the light of their reaction to the other's description. It is fully discursive.
- The teacher can adapt the activity set for the student only in the sense of referring to a particular illustrative experience.
- As there is no action directly on the world, the student cannot make adaptive changes to actions.
- There is no interaction with the world for the student to reflect upon, though she may reflect upon the experience referred to by the teacher, as well as on the teacher's description, and moreover the teacher can support this reflection as he/she knows the experience referred to and the descriptions offered.

From this comparison it should be apparent that the media are complementary to each other, that none supports the whole learning process, but that the computer-based tutorial-simulation program comes closest. The comparison is summarised in Table 1 (overleaf).

It should also be clear that there are a number of design devices for each medium that are used by designers to enable it to approximate to better coverage of the learning process, for example, the use of 'pre-emptive redescrptions' in presentation of a concept, the use of 'in-text activities' for print, or 'interactive video-cassette activities' for video, the use of a simulated model to allow interaction with a 'world' in computer-based tutorials, the use of reference to experience in discussion. All these devices help the student, but still leave some of the essential component activities unsupported. Students can supply these for themselves, especially if they are experienced or sophisticated learners. But they need support at least some of the time. If it is correct that the teaching-learning process is essentially a conversation, then especially at the advanced level of university study, students will need frequent support at the 'discursive' level, and this is precisely the activity that is least

TABLE I. Comparison of media coverage of the four component aspects of the learning process

	Discursive	Adaptive	Interactive	Reflective
Print	T's view as description Pre-emptive redescription	By S	Refers to experience	By S
Video	T's view as description	By S	With T's action	By S
Comp	T's view as description Pre-emptive redescription S's view in constrained form	By S and T	Using model	By S and T
Teacher/ student discussion	T's view as re/description S's view as re/description	By T	None	By S and T

S, student; T, teacher.

well-supported by the media on offer, and also the one that is most consuming of staff time and likely to be reduced as student numbers increase. The most important reason for academics to resist the expansion of student numbers without some increase in staff time is the consequent loss of this essential contribution to the learning process. The analysis above clarifies the one-to-one conversation between teacher and student, but lectures to large numbers are now the norm. We pin our hopes on the new technologies to fill the gap, but it is a forlorn hope.

The promise of multi-media

At the Open University in the UK multi-media courses have been in operation for over 20 years. In this context, 'multi-media' has always meant using several media—print, audio, video and computer materials—in the integrated delivery of a course. The term has now been hijacked by the advent of 'multi-media workstations' that combine all these media in a single workstation delivering text, digitised audio and digitised video as well as computer output via a computer monitor. Open University course materials that deliver these forms of communication via the separate media of print, audio-cassette or radio, and video-cassette or television, must now be referred to as 'multiple media' to distinguish the two.

In a distance-learning university, academics have to be very inventive to overcome the absence of what I have argued is the most crucially important teaching device, the one-to-one tutorial. Using the strengths of each medium for persuasive presentation of the rhetorical argument, together with the interactive devices referred to above, and supporting these with asynchronous text-based tutorials in the form of tutor-marked assignments, and occasional face-to-face teaching at study centres and summer schools, the OU has been able to achieve a high standard of degree-level study at a distance. But there are still students who drop out, and the standard of student attainment can always be improved, so there is a continual programme to further exploit the educational media in the enhancement of student

learning. As the media and delivery systems proliferate, new combinations are continually explored:

- (1) audio-vision—audio-cassette talking through text-based materials;
- (2) interactive video-cassette—video-cassette material plus related activities set for students to do;
- (3) interactive audio—computer program with random access to CD-ROM-based audio material;
- (4) interactive video—computer program with random access to video-disc-based material;
- (5) hypermedia—hypertext program giving indexed access to structured text, audio and video material;
- (6) audio-graphics—telephone tutoring on one telephone line plus computer-based data link on another giving tutor and student interactive access to the same computer screen;
- (7) computer conferencing—modem or cable data link between computers installed with conferencing software giving tutor and students access to the same text messages; and
- (8) interactive satellite tv—television broadcast using audio-conferencing between studio-based tutor and home-based students.

All these have their place in the provision of distance learning, for either pedagogical or logistical reasons or both. From the conversational framework developed earlier we could deduce that the ideal media combination would be a 'computer-mediated-audio-graphic-tutorial-hypermedia-simulation-conference', which offers experiential learning with 'pre-emptively adapted discussion' of it through the computer based tutorial-simulation, plus access to a database library via the hypermedia, plus synchronous discussion of some experiential interaction via the audio-graphics, plus asynchronous discussion through the computer conference. Such a workstation does not exist. Similar prototypes are being explored from within education, but unless industry and commerce develop a need for such a technology it is unlikely to develop very far.

As hypermedia systems become more widespread, offering computer-based access to large volumes of text, audio and video material, stored on hard disc or CD-ROM, there is an increasing expectation that this will act as the multi-media workstation that supplies all a student could need. It is important to critically assess the wisdom of this expectation. It is debatable whether students would accept screen-based text instead of print-based text to work from—screens are not equal to the 'desk-top' metaphor they aspire to, either in quality or in size, and that degradation will have pedagogical consequences we can only guess at, because the issue has not attracted much research. Also, the logistics of using computer-based materials are considerably more complex than those for using print. These two issues alone are enough to question the value of the single-workstation approach to delivering study materials. The third issue, and the focus of this paper, is the pedagogical value of hypermedia, one form of the new 'multi-media workstation'.

Two important features of personal computer systems come together in

hypermedia—their now large information storage capacity, and the new software formats referred to as hypertext. Both CD-ROM and hard disc systems offer such large storage capacity that it is possible to store whole books, to digitise audio and store, for example, long passages of speech, and to digitise video which, being more information-hungry than audio, can be stored as short chunks of, for example, key dynamic sequences. So the multi-media workstation can offer access to a small library of information using several media.

The type of access it offers determines the aspects of the learning it supports. If it is simply an indexed database of information, then it works in exactly the same way as a library of print materials, offering a description of the teacher's viewpoint on the subject, but is neither adaptive to student needs (except pre-emptively), nor interactive nor reflective. The addition of a hypertext system changes the nature of the access. The database may be indexed, but also makes extensive use of cross-reference between items, or chunks within the structure, and also allows users to make their own cross-references and to add annotations as they wish. The latter feature gives rise to some interesting claims for hypertext/hypermedia systems:

hypertext enables learners to construct, organize and convey personal knowledge ... learners help to construct the knowledge base [which] is therefore adapted by the learner to make it more meaningful (Jonassen 1991)

the student engages in a new way with the play and its context (Renaissance promotional video)

But cross-referencing and annotating are activities that have always been available to the student studying from text. Does hypermedia really offer anything more than a very small library, a piece of paper and a pencil? These educational provisions, while being recognised as important throughout the history of education, are seldom dignified with the rhetoric of constructivist theories of learning, for the very good reason that while they *allow* learners to “construct, organize and convey personal knowledge”, they certainly do not ensure that this happens. That is why the traditional methods of library, paper and pencil have been supplemented with complementary teaching activities, such as assignments with feedback in the form of marks or assessment grades, and tutorials, all of which *require* the student to construct organise and convey their personal knowledge. A hypertext system offers no such motivation, nor does it offer any pedagogical support for students trying to make the intellectual leap that links one idea to another, nor can it monitor the validity of the link they make.

The freedom to browse the intellectual hyperspace afforded by these systems sounds delightful to the subject expert, who already possesses a detailed conceptual map of the subject, but to the novice struggling to understand what kind of space it is, and what counts as a link between ideas, it could be a nightmare of confusion. When offered an indexed sequential discourse in a new subject, students typically take the default option provided by the author, and fail to rearrange that order,

whether it be print or computer-based material (Laurillard, 1984). In so far as a small library plus pencil and paper might be sufficient educational support for a student, as it often can be, and assuming that the particular selection made to stock its very small library is well-targeted for the task in hand, and assuming that the user has access to the necessary technology, then hypermedia is a convenient option. But the support it offers the learner is confined to controlled access to a description of the teacher's conception.

Summary

Using multiple media for the delivery of media-based course materials allows us to target each medium on the aspect of the learning process it best supports. They are all an improvement on lectures, at least. Each one has its strengths, as the comparative analysis showed, and none can adequately support every learning activity the student needs to undertake to be sure of attaining a good understanding. Students contribute a great deal themselves to the learning process, making their own links between theoretical description and experiential examples, reflecting on the underlying structure of the teacher's discourse, practising the representation of their description of the world in the relevant academic language—all of which activities have been identified as occurring when students use what has been called the 'deep approach' to learning (see, for example, Marton, *et al.*, 1984; Ramsden, 1988). But because students do not always manage to do this for themselves, they need support, and not just in the aspect of the learning process that one particular medium happens to address, but in all the component activities all the time. That is why each medium has to be used in the context of its integration with any of the others that can complement the support it provides. As Bates has pointed out, in a study of broadcast teaching programmes: "Different media can present the *same* knowledge in different ways, and media differ in their facility to develop student *skills in acquiring or using* knowledge". (Bates, 1984, p. 165, original italics). The student is rarely fully supported. That happens over time, as tutorials or tutor-marked assignments supply the discursive aspect that was missing from the presentational/interactive medium they were studying. From a pedagogic point of view, balancing the media means making the integration of the media as synchronised and as complete as possible. From a logistical point of view the analysis may be different. The pedagogic balance is meaningless if student access to the medium has not been considered. If it is a distance learning university, then we cannot hope for very much face-to-face interaction; if the numbers on a course are very large, then broadcast television is a much more efficient way of reaching all students than sending out video cassettes; if students are visually-impaired, then a computer-based speech synthesiser is their only means of instant access to a text, where print fails completely, and a spoken version on audio-cassette offers too little control. This paper has focused on the pedagogical decisions to be made about balancing the media, but the logistical issues are equally important (see, for example, Laurillard, 1992).

One basic principle for balancing the media, then is to target them on aspects of the learning process they support best. The same point applies to multi-media systems. They can be an excellent solution for certain pedagogical requirements and logistical conditions: when students need access to a small library, and have a good enough grounding in the subject that they know what they need to know, and the relevant material has been selected for the hypertext format, and when they have convenient access to a multi-media workstation. It does not offer very much support to the student, however. The student's problem is not typically the difficulty of cross-referencing and annotating text. It is more likely to be the conceptual one of making sense of the teacher's point of view, or coping with their unfamiliar terminology, or reinterpreting their experience, none of which are served any better by a multi-media system than by any of the existing media and media combinations. The proper role of multi-media is to play its own part as one of the multiple media integrated into a coherent course, capable of supporting students in all aspects of the learning process.

It is important that in adopting the new technologies we attempt to understand precisely what kind of role the various media play in supporting student learning. If we are clear about the pedagogical requirements they must meet, then it will be easier to adapt them to the educational environment, and thereby maximise their educational potential. If we are not sufficiently clear about what the new educational technologies must do, then education will evolve to fit what they offer. And technology is a powerful force, being driven by the twin engines of commerce and politics. This paper has offered an analytical framework to assist in rationalising the selection and use of the educational technologies on offer. At present, control of the educational technologies remains with the academics. While we still have it, we need to mould these technologies to our academic requirements, and make them work to serve academic ideals. Building a framework for making pedagogically-based decisions about the use of educational technologies is a programme that must continue to develop.

Correspondence: Diana Laurillard, Institute of Educational Technology, Open University, Milton Keynes MK7 6AA, UK.

REFERENCES

- BATES, A. W. (1984) *Broadcasting in Education: an evaluation* (London, Constable).
- DURBRIDGE, N. (1984) Developing the use of video cassettes in the Open University, O. ZUBER-SKERRITT (Ed.) *Video in Higher Education* (London, Kogan Page).
- JONASSEN, D. (1991) Hypertext as instructional design, *Educational Technology Research and Development* 39 (1), pp. 83–92.
- LAURILLARD, D. M. (1984) Interactive video and the control of learning, *Educational Technology*, 24, 6, pp. 7–15.
- LAURILLARD, D. M. (1992) *Comparative characteristics of teleconferencing media*, PLUM Report, Institute of Educational Technology, Open University, Milton Keynes.
- LAURILLARD, D. M. (1993) *Rethinking University Teaching: a framework for the effective use of educational technology* (London, Routledge).
- LOCKWOOD, F. G. (1989) A course developer in action—a reassessment of activities in texts, in

- M. PARER (Ed.) *Development, Design and Distance Education*, Centre for Distance Learning, Gippsland Institute of Advanced Education, Churchill, Victoria, Australia.
- MARTON, F., HOUNSELL, D. J. & ENTWISTLE, N. J. (Eds) (1984) *The Experience of Learning*. (Edinburgh, Scottish Academic Press).
- PASK, G. (1976) Conversational techniques in the study and practice of education, *British Journal of Educational Psychology*, 46, pp. 12-25.
- RAMSDEN, P. (Ed.) *Improving Learning: new perspectives* (London, Kogan Page)
- VYGOTSKY, L. (1962) *Thought and Language* (Cambridge, Mass, MIT Press).